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STATUS OF ALLIUM SERRATUM (LILIACEAE) AND DESCRIPTION OF A NEW SPECIES

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In 1871, Watson described "Allium serratum" from California. In the protologue he cited ten collections and listed *Allium amplectens* Torr. (1865) as a synonym, indicating that its type (Sonoma, 3 May 185–, *Bigelow s.n.*, NY) "is a very young undeveloped state and the name is inapplicable to the mature plant". Application of the current rules of nomenclature (Arts. 62 and 63) makes "A. serratum" superfluous and illegitimate. Later Watson (1879) reconsidered his circumscription of "A. serratum". Here he cited *A. amplectens* Torr. as a synonym of *A. attenuifolium* Kell. (1863). (We agree that the types of these names are conspecific; however, the correct name is *A. amplectens* Torr.) "Allium serratum" then apparently referred to a taxon represented by the syntypes originally cited in 1871.

During investigation into the taxonomy of the *Allium acuminatum* alliance to which "A. serratum" has been referred (Saghir et al., 1966) we studied all but four (*Bolander s.n., Douglas s.n., Kellogg s.n.,* and *Wallace s.n.*) of those ten collections. We believe the six collections studied represent two species. Five (*Hartweg 1991,* GH, NY; *Fremont 469,* GH; *Bridges 345,* NY, US; *Stillman s.n.,* NY; *Rich, s.n.,* NY) correspond closely to Watson's original description and he annotated them "Allium serratum". The other specimen (Benecia, 1853–4, *Bigelow s.n.,* GH) does not match the original description and Watson seems to have recognized this since he annotated it "Allium serratum, form". This is reinforced by a specimen (*Kellogg 1012,* GH) that he annotated in the same manner but that was not cited among the syntypes. Later authors incorrectly applied the name "A. serratum" to these latter specimens disregarding the fact that they do not correspond to Watson's description nor his interpretation of what was "A. serratum" and what was a form of this species.

The name *Allium peninsulare* Lemmon ex Greene (1888, Holotype: *Lemmon s.n.* NDG) is the correct name for Watson's typical "A. serratum" and has long been used in this sense. We consider Watson's "A. serratum, form" to represent a distinct species as follows:

Allium serra McNeal & Ownbey, sp. nov. (Fig. 1).

Bulbus ovoideus vel subglobosus, 8–12 mm longus, tunico exteriore plerumque brunneo, manifeste celluloso-reticulato, maculis transverse elongatis, deorsum angulatis, regularibus verticalibus ordinibus dispositis, tunicis interioribus albis; folia 2–4, anguste concavo-convexa vel subteretia, scapo aequilonga vel quarta parte breviora; scapus teres, gracilis, 15–30 (50) cm longus; bracteae 2/3, lanceolato-ovatae vel ovatae, acuminatae, 1–2 cm longae; umbella 10–35 (vel pluribus) floribus, compacta, pedicellis 6–15 mm longis; pedicelli et flores maturi simul decidui; segmenta perianthii integra rosea, lanceolata vel lanceolato-ovata, acuta, obtusa vel emarginata, erecta, papyracea maturescentibus fructibus et conniventia super capsulam; segmenta perianthii exteriora 8–11 mm longa et 3.0–5.5 mm lata, interiora breviora et angustiora; stamina inclusa, antheris luteis vel rubris, apiculatis; capsula triloba, cristata 3 minutis bilobis processibus circa styli basin; stigma capitatum, trilobum; semina atra, alveolis minute asperis.

Type: California, Stanislaus Co., 20.5 mi W of Patterson in Canyon Del Puerto, dry rocky hillside above the road, 11 Apr 1968, *McNeal 397* (Holotype, WS!; isotype, CPH!)

The specific epithet refers to the outer bulb coat which, when broken, has a serrate edge resulting from its typical herringbone reticulation pattern (Fig. 1,f).

Representative specimens (for a complete list of specimens see McNeal, 1970): Alameda Co., Corral Hollow, *Eastwood & Howell 5293* (CAS); Butte Co., Chico, May 1918, *Rixford* (CAS); Colusa Co., Rt. 20, 5 mi E of the Lake Co. line, *Benson 4327* (ND, POM); Contra Costa Co., 2 mi inside the N gate of Mt. Diablo, *Hoffman 2796* (WS); Glenn Co., hills W of Willows, *Eastwood 11149* (CAS); Lake Co., 6 mi N of Lower Lake, *Eastwood & Howell 5583* (CAS, UC, WTU); Merced Co., 10 mi S of Los Banos, *Hoover 2891* (UC, US, WS); Napa Co., 1.3 mi S of Knoxville, *Keck 2374* (CAS, DS, POM, UC); San Joaquin Co., E end of Corral Hollow, *Eastwood & Howell 2094* (CAS); Santa Clara Co., Edenvale, *Thomas 8990* (DS, OSC, RSA); Solano Co., foothills of the Vaca Mts., W of Vacaville, *Heller 15559* (DS, MO, NY, UC, US, WS, WTU); Stanislaus Co., Del Puerto Canyon, 8.3 mi W of Patterson, *McNeal 394* (CPH, WS).

Allium serra grows on heavy clay or serpentine soils in the Inner Coast Range of California from Butte Co. south to central Merced Co. at 300–600 m. It is associated with such plants as *Pinus sabiniana, Heteromeles arbutifolia, Quercus sp., Rhus diversiloba, Dodocatheon hendersonii,* and several species of introduced annual grasses common throughout the range.

Allium serra belongs to the *A. acuminatum* alliance on the basis of its thick, cellular reticulate bulb coat, which develops from the inner epidermis of the inner leaf base (McNeal and Ownbey, 1973). It appears to be the most closely related to *A. peninsulare* and *A. amplectens*. These are widespread species; *A. peninsulare* occurs south and east of *A. serra* except for two records in the southern part of its range, while *A. amplectens* is sympatric with *A. serra* throughout its range. The resemblances to these two species are in an unrelated combination of morphologic characters. In addition to characteristics in the key below, *A. serra* resembles *A. amplectens* in that the perianth segments, which are erect at anthesis, become papery and connivent over the capsule as it matures. Both species have short pedicels and compact umbels with the pedicel falling as a unit with its flower when the capsules are mature. In *A. peninsulare* the pedicels are comparatively long and the umbels are open with the pedicels and flowers persisting after the capsule matures. In *A. peninsulare* flowers are deep reddish purple while in *A. amplectens* they are white or sometimes flushed with pink; *A. serra* has bright pink flowers.

Chromosome numbers of both *Allium serra* and *A. peninsulare* are $2n = 14$ while *A. amplectens* has two chromosomal races, $2n = 3x = 21$ and $2n = 4x = 28$, both of which occur in the range of *A. serra* (Table 1).

Table 1. Chromosome Counts for *Allium*. All collections are from California; vouchers are in WS. Our counts were all made during first meiotic metaphase. * indicates previously unpublished counts by Dr. Hannah C. Aase.

Allium serra McNeal & Ownbey

Alameda Co., Livermore—Tesla Rd., 15.4 mi from Livermore, *Hoffman 2799,* **7 II***; Colusa Co., above Bear Creek, ca 15 mi N of Rumsey, *Henry s.n.* **7 II**; Lake Co., Hwy. 20, 12 mi E of its jct. with Hwy. 53, *McNeal 408,* **7 II**; Stanislaus Co., Del Puerto Canyon, 20.5 mi W of Patterson, *McNeal 397,* **7 II**; Yolo Co., Cache Creek, 3 mi N of Rumsey, *McNeal 407,* **7 II.**

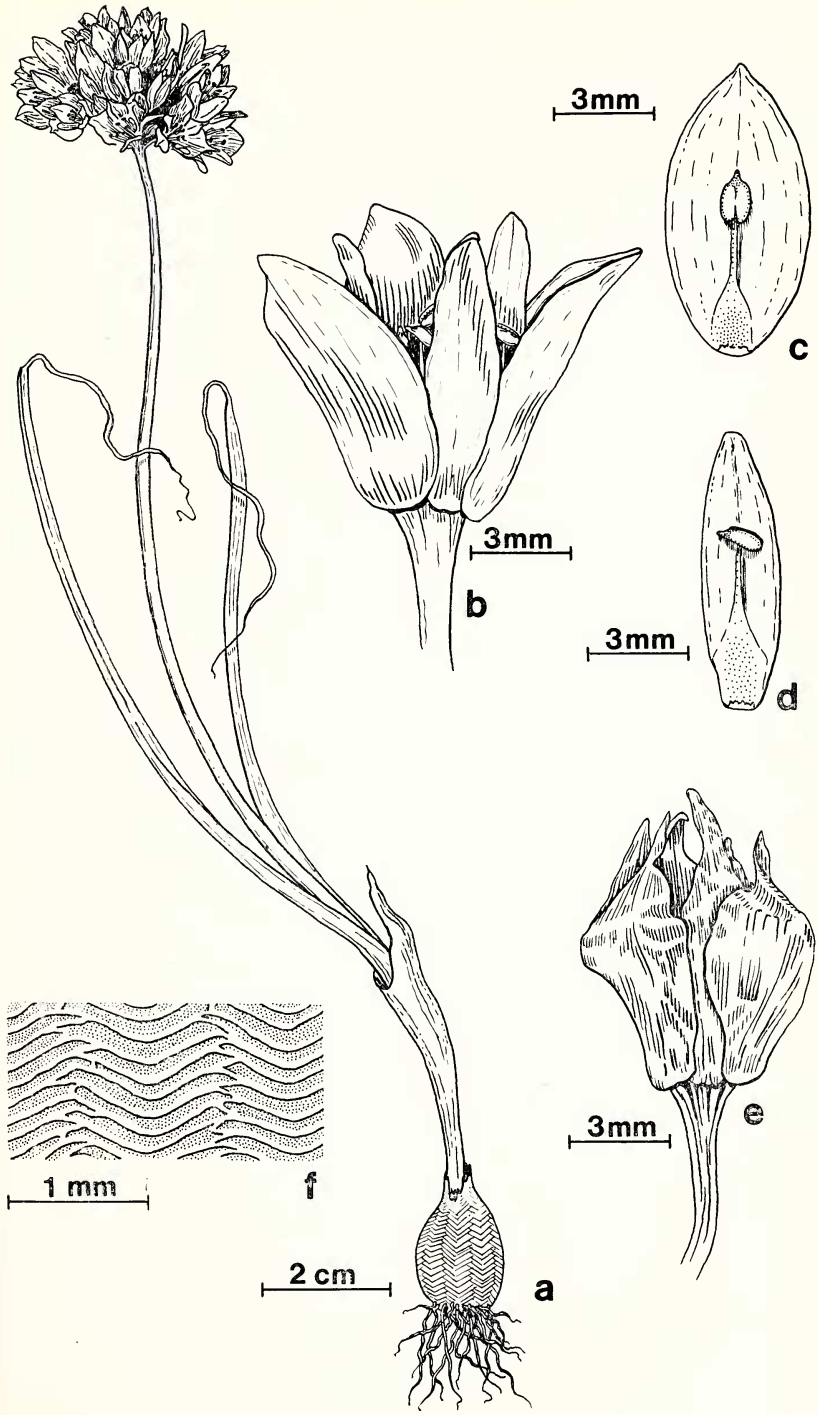
Allium amplectens Torr.

Colusa Co., Rt. 20, 21 mi SW of Williams, *Ownbey and Ownbey 2951,* **21 I*** (Achiasmatic); Lake Co., 6 mi S of Hwy. 20 on Scotts Valley Rd. to Lakeport, *McNeal 409,* **14 II**; 2.8 mi N of Middleton, *Ownbey and Ownbey 2954,* **14 II***; Marin Co., Big Rock Ridge, 2–3 mi W of Hamilton AFB, *Robbins s.n.,* **21 I*** (Achiasmatic); San Mateo Co., Jasper Ridge experimental area, edge of Stanford U., *Raven s.n.,* **14 II**; Stanislaus Co., Mt. Hamilton-Livermore Rd., 1.0 mi N of Canyon Del Puerto Rd., *McNeal 575,* **21 I** (Achiasmatic).

Allium peninsulare Lemmon ex Greene

Butte Co., Chico-Paradise Rd., 14.8 mi E of Chico, *Hoffman 3774,* **7 II***; Kern Co., Rt. 178, 1.5 mi E of Onyx, *McNeal 389,* **7 II.**

Fig. 1. *Allium serra*. a, Habit. b, Flower. c, Outer perianth segment with anther in erect position. d, Inner perianth segment with anther in versatile position. e, Older flower with perianth segments connivent over the capsule. f, Portion of outer bulb coat with herringbone reticulation pattern. From 35 mm transparency of living plant and type collection.


3mm
c
3mm
b
3mm
d
e
3mm
1 mm
f
2 cm
a

The following key distinguishes *Allium serra* from other members of the *A. acuminatum* alliance that have a similar herringbone reticulation pattern on the bulb coats.

a. Ovary crested with 6 lateral processes; meshes of the reticulum wavy, not in sharply serrate transverse rows, forming a more or less indistinct herringbone pattern, or contorted; inner and outer perianth segments approximately equal in length and breadth. . . . . *Allium amplectens* Torr.

aa. Ovary crested with 3 minute, 2-lobed central processes; meshes of the reticulum in sharply serrate transverse rows, forming a herringbone pattern; inner perianth segments shorter and narrower than the outer.

b. Perianth segments connivent after anthesis, becoming papery; umbel shattering, each flower with its pedicel deciduous as a unit. . . . . *Allium serra* McNeal & Ownbey

bb. Perianth segments not connivent after anthesis, texture dull or shiny, never papery; flowers persisting.

c. Plants low, fleshy; leaves 3–6, the shorter ones arcuate, the longer tortuous; bracts broadly ovate, abruptly acuminate; umbel compact, pedicels short. Sea cliffs from San Mateo Co. to Mendocino Co., California . . . *Allium dichlamydeum* Greene

cc. Plants taller, slender or stout, not appearing fleshy; leaves 2–4, straight or curved; bracts lanceolate to ovate, acuminate; umbels loose, pedicels spreading. Interior California from Butte Co. south along the Sierra Nevada foothills and Coast Range into Baja California, also in the Santa Cruz Mountains of San Mateo Co.

d. Inner perianth segments crisped. . *Allium crispum* Greene

dd. Inner perianth segments with margins entire or obscurely serrulate, never crisped. . . . . *Allium peninsulare* Lemmon ex Greene

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Dr. Marion Ownbey died 6 December 1974 without seeing the final drafts of this manuscript. As senior author, I am solely responsible for any errors that appear.

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RE-ESTABLISHMENT OF THE GENUS HYBRIDELLA (ASTERACEAE:HELIANTHEAE)

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Hybridella is a small genus of three herbaceous perennial taxa native to Mexico. It was treated as a subgenus of *Zaluzania* by Robinson and Greenman (1899) and by Sharp (1935), although it was described as a genus by Cassini in 1821. During a study of *Zaluzania* (Olsen, 1977), I became aware that *Hybridella* comprises a cohesive unit phyletically remote from *Zaluzania*. Based on morphological, cytological, and ecological data, it should be positioned elsewhere. Table 1 lists major differences between the two genera.

There are only two chromosome counts available for *Hybridella: H. globosa* var. *globosa* ($n = 16$, Powell and Turner, 1963) and *H. globosa* var. *myriophylla* ($n = 16$, *Olsen 265*, LL, published here). These counts suggest a base number of $x = 16$ for the genus.

The most likely relationships of *Hybridella* are with *Heliomeris*, a *Viguiera* segregate (Yates, 1967). The base chromosome number of *Heliomeris* is $x = 8$ (Turner, 1976), presumably one of the ancestral numbers in the Heliantheae (Stuessy, 1976). It is likely that the ancestral base number for *Hybridella* is $x = 8$, with stabilization occurring at the tetraploid level. This coupled with the obvious floral similarities between *Hybridella* and *Heliomeris* (Table 1), suggests a close relationship between the two taxa.